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A REVIEW OF *EUCYLLUS* HORN (COLEOPTERA: CURCULIONIDAE, BRACHYRHININAE, PERITELINI)

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ABSTRACT: The genus *Eucyllus* Horn is reviewed with the three species: *vagans* Horn, *unicolor* Van Dyke, and *echinus* Van Dyke, redescribed and discussed. Three additional species are described as new: *saesariatus* from Sonora, Mexico, and Arizona, *carinarostris* from California, and *cinereus* from California. *Eucyllus tinkhami* Tanner is placed in the genus *Eucilinus* Buchanan. Distributional and biological information is given for each.

While we were reviewing the Peritelini it became evident to us that the whole tribe was in need of study. Many new species were encountered in fieldwork in western North America. Because an abundance of material exists and several new species required description, the genus, *Eucyllus* Horn was chosen as a starting point.

The following standard abbreviations (Arnett, *et al.*, 1969) are used: BYUC—Entomological collections, Brigham Young University; CASC—Entomological collections, California Academy of Sciences; CIAN—Centro de Investigaciones Agrícolas del Noroeste; CSCLB—Entomological collections, California State University, Long Beach; ELS—E. L. Sleeper collector; ELSC—E. L. Sleeper collection; FWPC—Frank W. Pelsue collection; INIA—Instituto Nacional de Investigaciones; LACM—Natural History Museum of Los Angeles County; and USNM—United States National Museum.

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tional Monument were supported by grants from the Long Beach California State College Foundation.

EUCYLLUS HORN

Eucyllus Horn, 1876:74.

Eucyllus Van Dyke, 1936:31, (*lapsus*).

Type species: *Eucyllus vagans* Horn, by monotypy.

Description: Rostrum slightly longer than broad, continuous with head; epistoma smooth, divested of scales, triangular in shape with carinate margins, and a fringe of 10–12 setae bordering the carinate margins; head not as long as broad, with smaller and more abundant punctures than rostrum, little or no sculpturing; antennae inserted in the basal third of rostrum; scrobe a flat-bottomed channel with no pronounced convex area distad of the eye. Funiculus with seven segments, vestiture of scales and setae similar to remainder of body; scape feebly arcuate attaining anterior margin of prothorax; club oval-acuminate, clothed with short fine setae. Eyes nearly round,

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Figures 1–10a. Spermathecae of *Eucyllus*. 1. *Eucyllus vagans* Horn, Mexico, Baja California Norte, Puertecitos, V-31-58. 2. *E. vagans*, California, San Bernardino Co., Upper Lucerne Valley, X-2-64. 3. *E. vagans*, California, San Diego Co., Pamitas Spring (3 mi W Carrizo Springs, III-1-58. 4. *E. vagans*, Mexico, Baja California Norte, Laguna Salada, II-20-59. 5. *E. saesariatus*, new species, Mexico, Sonora, 51 mi E San Luis, XII-30-60, paratype. 6. *E. carinarostris*, new species, California, Riverside Co., Pinto Wash Well, II-17-62, holotype. 7. *E. unicolor* Van Dyke, Nevada, Nye Co., 19 mi SE Lathrop Wells, III-24-70. 8. *E. echinus* Van Dyke, Nevada, Lincoln Co., 10 mi N Hwy. #91 on Elgin Road, V-18-62. 9. *E. echinus*, Mexico, Sonora, 51 mi E San Luis, XII-30-60. 10. *E. cinereus*, new species, California, Inyo Co., Grandview P.C., VIII-10-65, paratype. 10a. *E. cinereus*, a different individual. Line represents $\frac{1}{2}$ mm.

strongly convex, and coarsely faceted. Prothorax not as long as broad, sides feebly arcuate, anterior margin truncate, posterior margin rounded. Scutellum small, obscured by elytra. Elytra nearly twice as long as broad; humeri rounded, feebly prominent, sides parallel, tapering to apex; striae defined by round deep punctures, setae usually arranged in two longitudinal rows alternately spaced on the interval. Venter of body with vestiture similar to dorsum; however, the recurved setae are slender, and truncate at apices; pro- and mesocoxae contiguous with metacoxae, widely separated. Femora one-third longer than tibiae, beginning rather slender and gradually becoming clubbed distally, no teeth or definite spines present, vestiture of scales and recurved setae similar to other parts of the body; tibiae slender, broadening distally, vestiture similar to femora, apex with teeth, tibiae 1 and 2 with a short mucro, tibia 3 without mucro; tarsus with first segment as long as second and third combined, fourth segment almost as long as first three segments combined, dorsal vestiture of segments 1-3 recurved setae and scales, fourth segment with fine setae.

Remarks: Horn described *Eucyllus* in 1876 placing it between *Dysticheus* Horn and *Thinoxenus* Horn, a placement retained by all subsequent workers through Kissinger (1964). *Eucyllus* Horn, *Thinoxenus* Horn, *Dysticheus* Horn, *Rhypodillus* Cockerell, *Eucillinus* Buchanan, and two undescribed genera form a group of morphologically very similar genera. The described genera can be separated easily in Kissinger (1964).

Eucyllus, for the most part, inhabits arid habitats of the desert (Fig. 32). With the exception of *E. cinereus*, members of this genus are restricted mostly to the Creosote Bush Scrub plant community, with *E. echinus* and *saesariatus* barely reaching into the Mesquite-Grassland plant community. *Eucyllus cinereus* is found in Pinyon-Juniper communities. The other genera of the group are coastal or montane.

Eucyllus remained monotypic until 1936 when Van Dyke added two species; *E. echinus* and *unicolor*. In this paper we are describing three new species of *Eucyllus*, bringing the total number of species to six.

In 1959, Tanner described *Eucyllus tinkhami*. Upon re-examination of paratypes of this species, particularly the proventriculus and tibial apices, we conclude that it does not belong in *Eucyllus* and is in fact a subspecies of *Eucillinus* (*Thysanochorhinus*) *aridus* Van Dyke. It should then be known as *Eucillinus* (*Thysanochorhinus*) *aridus tinkhami* (Tanner), new combination. The type locality for *E. aridus aridus* is Cronise Lake, Cali-

fornia, approximately 35 miles northwest of the Kelso Dunes; the type locality of *E. aridus tinkhami*.

The paucity of specimens of *Eucyllus* in collections results from the fact that members of the genus are nocturnal and seek refuge about the bases of food plants during the daylight hours when most insect collectors are active. *Eucyllus vagans* and *saesariatus* have been taken at night throughout the year.

Species of *Eucyllus* are largely parthenogenetic; males being less frequently encountered than females. Populations from south and east of the Colorado River have a higher frequency of males than those encountered elsewhere. In the material available to us, *E. echinus* from Arizona has a male-female ratio of 1:2.5; whereas, in *saesariatus* it is 1:1.25. Males were not found in the population of *E. echinus* from Nevada and Utah, *E. unicolor*, or *E. carinarostris*.

Eucyllus vagans has an interesting change in sex ratio from south to north in its range. In Baja California del Norte, Mexico (the extreme southern part of the range) the male-female ratio approaches 1:1 from below sea level to about 1000 ft elevation. No males are known from above 1000 ft. In the vicinity of Borrego Valley and the Salton Sea in California the ratio is 1:1.5. From north of the Riverside-Imperial County line or the vicinity of the northern end of the Salton Sea, only one male is known. It is a very old specimen, presented to Sleeper by J. G. Shanafelt who verified that the data were correct. It bears the locality label "Taquitiz Cyn. nr. Palm Sprs." From the remainder of the range northward and northeastward for more than 260 miles, no males are known.

In all species, except *cinereus*, the number of mature ova per female at the time of peak production varied from 5-10, with a mean of 8.25 per female. There seemed to be no significant difference between species as to ova number. Ova averaged 0.5 mm in *echinus* and 0.65 mm in *vagans*. *Eucyllus vagans* deposits approximately 250 eggs over a one to two month period after which ova production nearly ceases. Ova are deposited in the soil about the bases of the food plant.

In the four species in which males are known, there are three distinct types of aedeagi. In the larger species the aedeagi are very long, slender and twisted at the apical third, terminating apically in a more slender, elongate, blunt knob (Fig. 20). In *echinus* the aedeagus is rather short, parallel-

sided and tapering apically to an abrupt, blunt apex, not curved or twisted (Fig. 21). The aedeagus of *cinereus* is short, narrowed, and blunt at the apex (Fig. 19).

The spermathecae are useful for separating the species. Both fresh and dried specimens were dissected; no detectable differences were noted between either.

KEY TO THE SPECIES OF *EUCYLLUS*

1. Larger species, 4.5–7.7 mm in length; second segment of funiculus almost twice as long as third 2
- 1'. Smaller species, 3.7–5.3 mm in length; second funicular segment slightly longer than third 3
2. Setae of dorsal surface of body 4–7 times as long as broad, a few only 2–3 times as long as broad, acute to blunt apices, with a strongly arcuate concavity on posterior side; feeble indication of a median sulcus on rostrum (Fig. 28) *vagens* Horn
- 2'. Setae of dorsal surface of body 10–15 times as long as broad with a few 4–7 times as long as broad, acute apices, with feebly arcuate concavity on posterior side; rostrum with a feeble indication of a median carina (Fig. 31) *saesariatus*, new species
3. Setae of dorsal surface as much as three times as long as broad, blunt at apices, erect and appearing club-like 4
- 3'. Setae of dorsal surface not more than twice as long as broad, recurved and peg-like in appearance 5
4. A rather robust species with many dark patches on the elytra and prothorax, overall color straw; setae robust and erect; feeble indication of a median carina on dorsum of rostrum posterior to the epistoma (Fig. 23); spermatheca as in figures 8–9 *echinus* Van Dyke
- 4'. A smaller species, uniformly gray in color with a few darker patches; setae finer than preceding species, prominently erect; spermatheca as in figures 10–10a *cinereus*, new species.
[Note: the recently described species *Eucyllus horridus* Hatch (1971:265) will key to *cinereus*. It appears that *horridus* is not a *Eucyllus*, but belongs to an as yet undescribed genus of Peritelini. Although this casts some doubt on the placement of *cinereus* in *Eucyllus*, it seems wise to leave all species in their present status until the new genera of this group are described.]
5. Strong median carina posterior to epistoma (Fig. 22); spermatheca as in figure 6 *carinarostris*, new species
- 5'. Feeble indication of a median sulcus posterior

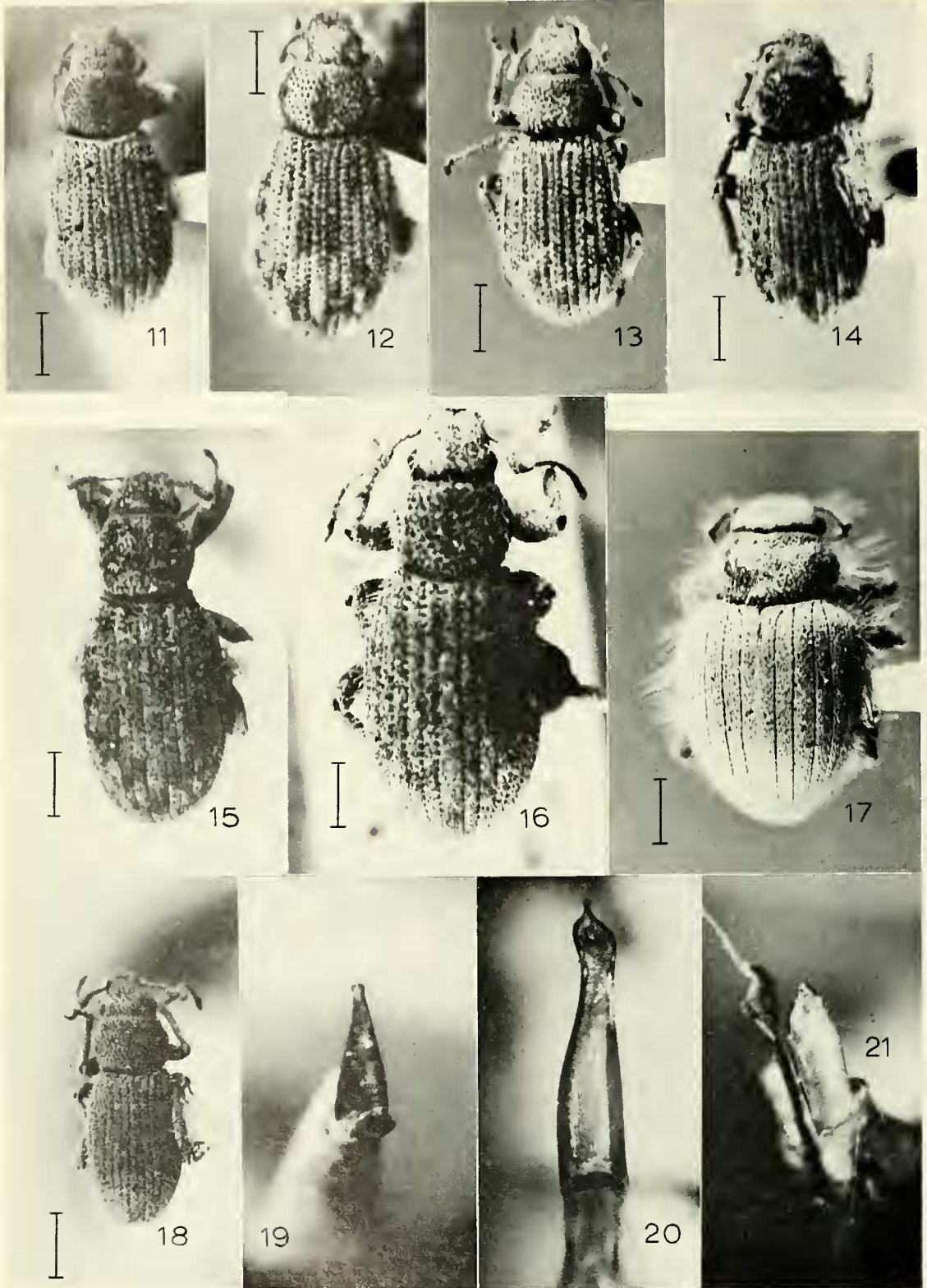
to epistoma; spermatheca as in figure 7 *unicolor* Van Dyke

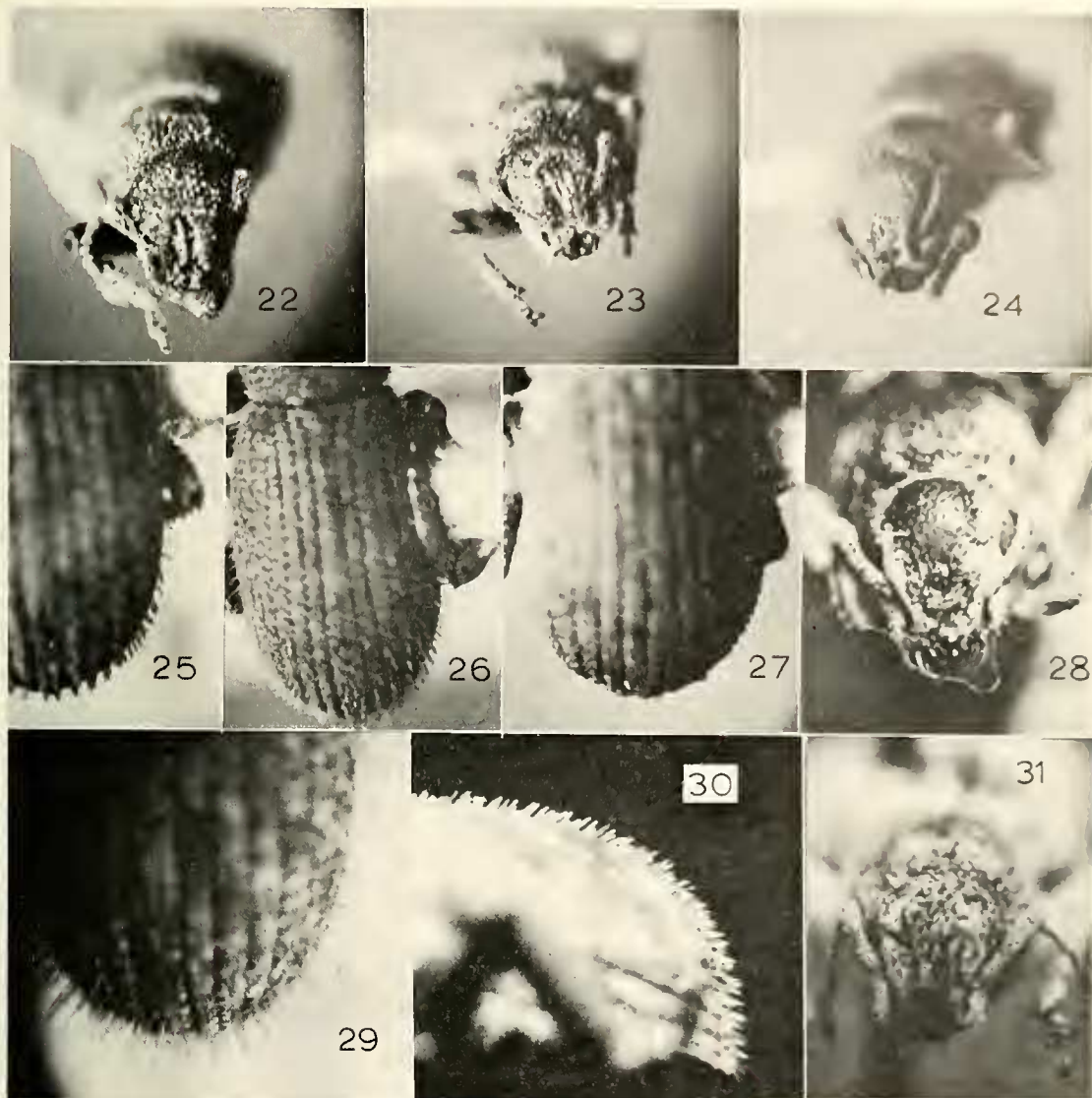
Eucyllus vagans Horn Figures 1–4, 15, 28, 30

Eucyllus vagans Horn 1876:76. Type locality—"Arizona and California adjacent." Here restricted to Carrizo Springs, Imperial Co., California. The only specimen in the Museum of Comparative Zoology, Harvard University was examined and is designated lectotype. It bears the following data: 1) gold disc (= California). 2) 1937. 3) Type. 4) *Eucyllus vagans* Horn. 5) Lectotype label-(A female).

Description: Body length 4.5–7.7 mm (mean ♂ 5.85; ♀ 6.77 mm); width 2.3–3.5 mm (mean ♂ 2.56; ♀ 3.03 mm); elongate oval; vestiture brownish gray with silver patches on the head, prothorax and abdomen. Body densely clothed with white and silver (triangular scales; moderately clothed with erect to suberect and recurved seta-like scales, set in deep punctures, four to seven times longer than broad at base with acute to nearly blunt apices. Shape of elongate setae, in cross section, indicates a strongly arcuate concavity. Rostrum clothed with white scales with a small silver patch dorsad of each eye and a median patch extending from posterior margin of the head to just past the anterior margin of the eyes; strongly sculptured with large punctures, this evident when denuded; with feeble indication of dorsal sulcus extending from just posterior of epistoma almost to head. Head feebly sculptured with smaller and more abundant punctures than rostrum. Funiculus with first and second segment same length, second twice length of third. Prothorax with vestiture of white scales with three longitudinal stripes of brown to silver scales; disc coarsely punctured with nearly round deep punctures with a mean of 17.1 per .25 mm² and rather uniform in distribution. Elytra with dirty white scales and several irregular patches of silvery to brown scales forming no definite pattern. Femora with band of silvery scales at distal third; apical comb of tibia with anterior teeth rather short and thick, becoming slightly longer and thinner towards posterior. Aedeagus long and rather slender, sides almost parallel for basal third of length tapering for another third then broadening again twisting down, tapering to a blunt knobbed apex; spermatheca as in figures 1–4.

Distribution: California, Inyo Co., 8.5 mi SW Westgard Pass, 6000 ft. eastward (below 6000 ft) to Nevada, Nye Co., Cane Springs, thence to the Mormon Mountains in Lincoln Co., Washington Co., Utah, southeastward to near Colorado City, Arizona, westward to Littlefield, Arizona, south to the Colorado River, west of the Colorado to the delta in Baja California del Norte then south to Mission





Figures 22–31. 22. Rostrum of *Eucyllus carinarostris*, ♀, California, Riverside Co., Pinto Wash Well, III-17-62, holotype. 23. Same of *E. echinus*, ♀, Mexico, Sonora, 51 mi E San Luis, XII-30-60. 24. Same of *E. unicolor*, ♀, Utah, St. George. 25. Apical setae of *E. echinus*. 26. Same of *E. cinereus*. 27. Same of *E. unicolor*. 28. Rostrum of *E. vagans*. 29. Apical setae of elytra of *E. saesariatus*. 30. Same of *E. vagans*. 31. Rostrum of *E. saesariatus*. Figures of various scales.

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Figures 11–21. 11. *Eucyllus unicolor*, ♀, St. George, Utah. 12. *E. echinus*, ♀, Arizona, Pinal Co., Picacho, V-1-42. 13. *E. echinus*, ♀, Mexico, Sonora, 51 mi E San Luis, XII-30-60. 14. *E. carinarostris*, ♀, California, Riverside Co., Pinto Wash Well, II-17-62, paratype. 15. *E. vagans*, ♀, California, San Diego Co., 3 mi W Carrizo Springs, XI-15-58. 16. *E. saesariatus*, ♀, Mexico, Sonora, 51 mi E San Luis, XII-30-60, holotype. 17. *Eucyllus* (*Thysanocorhinus*) *aridus tinkhami*, ♀, California, San Bernardino Co., Kelso Dunes, V-25-58, ELS. 18. *Eucyllus cinereus*, ♀, California, Inyo Co., White Mts., Grandview Public Camp, VIII-10-65, paratype. 19. *E. cinereus* aedeagus. 20. *E. saesariatus* aedeagus. 21. *E. echinus* aedeagus. Figures 11–18 the line equal to 1 mm. Figures 19–21 no scale.

TABLE 1. Size of *Eucyllus vagans* Horn from south to north. All measurements in millimeters. Each sample contained 30 randomly selected individuals.

Length		Width	
Mean (range) \pm SD		Mean (range) \pm SD	
<i>Mission Calamujue, 900 ft., Baja California del Norte</i>			
♂	5.45 (4.5–5.8) \pm .012	2.38 (2.0–2.6) \pm .013	
♀	6.23 (5.5–6.9) \pm .014	2.78 (2.5–3.1) \pm .026	
<i>Vicinity of Carrizo Springs, 250 ft., Imperial Co., California</i>			
♂	5.90 (5.3–6.4) \pm .011	2.51 (2.4–2.6) \pm .0006	
♀	6.31 (5.5–6.8) \pm .012	2.76 (2.4–3.0) \pm .002	
<i>Indian Cove, Joshua Tree National Monument, Riverside Co., California*</i>			
♀	6.17 (5.0–6.5) \pm .012	2.77 (2.2–3.0) \pm .025	
<i>Lucerne Valley, 3000 ft., San Bernardino Co., California*</i>			
♀	6.66 (6.2–7.7) \pm .013	3.01 (2.8–3.6) \pm .003	
<i>Wildrose Ranger Station, Panamint Mts., 4200 ft., Inyo Co., California*</i>			
♀	5.19 (4.5–5.7) \pm .012	2.39 (2.1–2.6) \pm .020	
<i>Lathrop Wells, 2900 ft., Nye Co., Nevada*</i>			
♀	6.12 (5.5–6.7) \pm .014	2.74 (2.5–3.1) \pm .002	

* No males found in sample.

Calamujue, northwest to El Rosario, eastward around the south end of the Sierra San Pedro Martir, thence north along the eastern slopes of this mountain range (below 2000 ft) over San Matias Pass, south to La Parra on the northwestern slope of the Sierra San Pedro Martir, north to Valle de la Trinidad to San Matias Pass northward along the eastern flanks of the Sierra de Juarez into California, throughout the Colorado Desert parts of Southern California to Banning and Morongo Valley, around and along the north flank of the San Bernardino and San Gabriel Mountains north to Mojave and throughout the Owens Valley wherever *Larrea* occurs (Fig. 32). A total of 4286 specimens were examined.

Remarks: *Eucyllus vagans* is the most plastic member of the genus and may represent a complex of species. Morphological variation presented several problems in this respect. Isolated pockets of this species appeared, superficially, to be distinct. Certain of these populations (for example, those from Valle de la Trinidad, Baja California del Norte, and Wildrose Ranger Station in the Panamint Mountains, Inyo County, California) are so different in scalation as to be easily distinguished from the remainder of the specimens examined. These could be separable as subspecies.

However, the authors do not feel it wise to name subspecies in parthenogenetic species. No significant differences were found in the spermathecae, although body proportions varied in the different populations. Table 1 indicates the range in lengths and widths and their respective means.

As can be seen from the means in table 1, specimens from Wildrose Ranger Station are relatively smaller and broader than the other samples. The means of leg lengths, antennal proportions, and other body proportions follow a similar pattern. The sample from Valle de la Trinidad was not large enough to analyze (only 15 specimens).

In *vagans* there is a relationship between setal length and age. Newly emerged specimens have rather elongate pointed setae (not approaching length of *saesariatus*). The tips of these setae break or wear off shortly after emergence in most individuals resulting in the broader, blunter scales normally considered typical of *vagans*.

The selection of Carrizo Spring as a type locality was based on two factors. First, other species of snout beetles collected and described at about the same time have this as a type locality (= Carisa Creek). These species have been recently collected with *E. vagans* at this location. This location was a stage and rest stop where the travelling collectors, of that time, would have felt safe to wander around collecting specimens. Second, material taken there seemingly represents the typical species (as currently recognized) and this population has a sex ratio of males to females of about 1:1.

Biology: *Eucyllus vagans* has been encountered under or feeding upon a larger variety of plant species than any of the other species. These include *Larrea tridentata*, *Franseria dumosa*, *Hymenoclea salsola*, *H. monogyra*, and *Atriplex* spp. The species also has been taken in pitfall traps and walking over blacklite and white light sheets.

Newly emerged forms appear on vegetation in May or June depending upon the latitude. The newly emerged individuals feed briefly, then most become dormant until October. Occasional stragglers are taken year around on the host plants, particularly *Hymenoclea* and *Larrea*.

Eucyllus saesariatus, new species

Figures 5, 16, 20, 29, 31

Holotype: Female, Mexico, Sonora, 51 mi E San Luis, XII-30-60, ELS, in ELSC #80. *Allotype:* Male, same data as holotype. Length 6.3 mm; width 2.7 mm.

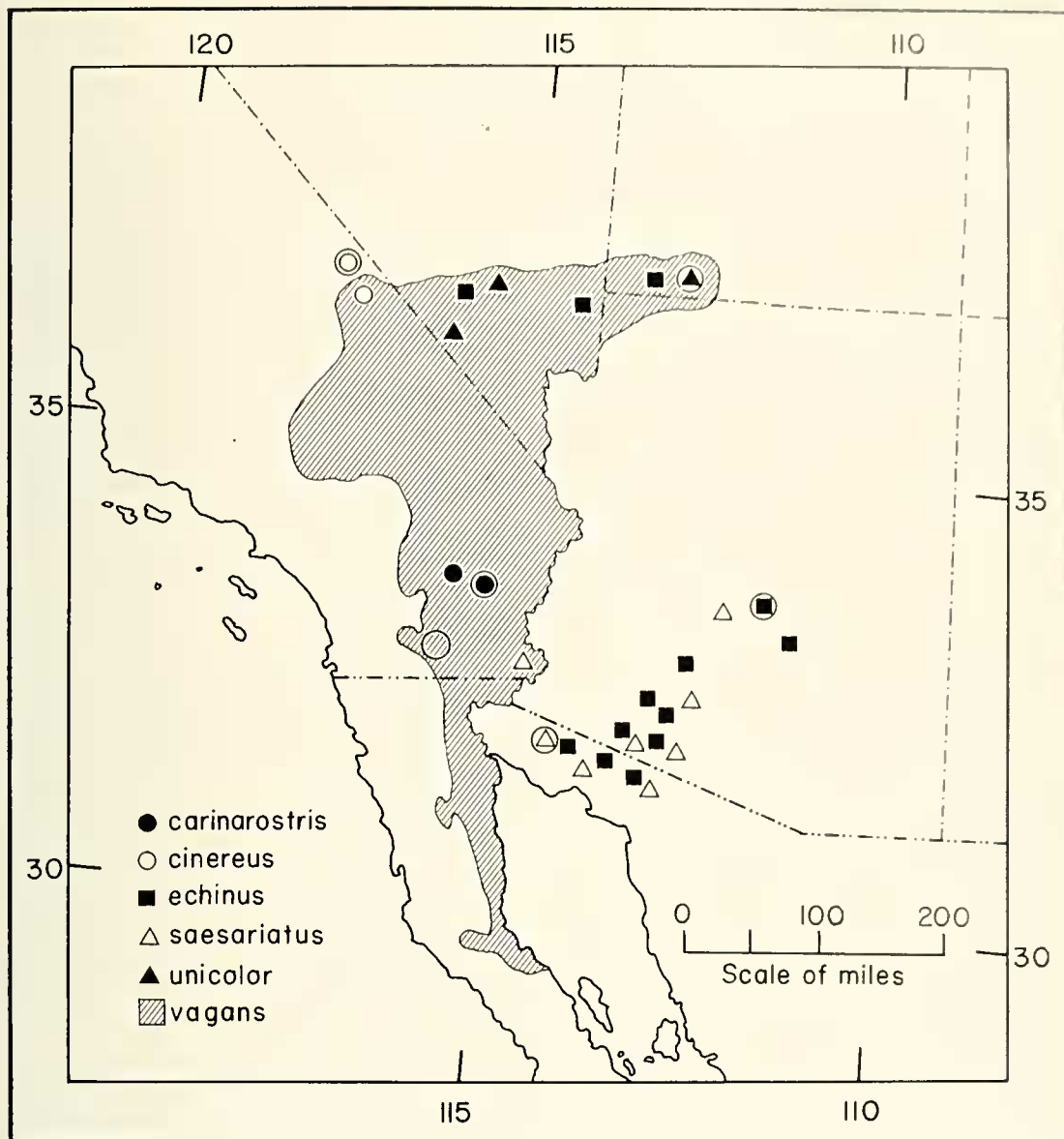


Figure 32. Distribution of *Eucyllus* species in the United States and Mexico. Symbol enclosed in a circle indicates the type locality for the species.

Differing little from the holotype, except for concavity in sternites 1 and 2. Aedeagus similar to *vagans* (Fig. 20).

Description: Length 7.1 mm; width 3.4 mm; elongate oval; vestiture dirty gray with silver to brownish patches on the head, prothorax, and abdomen; seta-like scales erect, ten to fifteen times longer than broad with some four to seven times as long as broad, all setae with acute apices; in cross section, setae with a feebly arcuate concavity. Rostrum slightly longer than broad; posterior to apex of

epistoma a feeble indication of a median carina with a teardrop-shaped fovea on each side of the carina forming a "V". distad to the carina a deep oval pit, this evident only when denuded; rostrum strongly sculptured when denuded. Funiculus with first segment as long as second, second segment almost twice as long as third. Prothorax dirty white with three longitudinal stripes of silver scales; disc with deep irregular punctures with a mean of 13.5 per .25 mm². Elytra dirty white, with irregular patches of silver to brown scales. Femora with a band of silver scales

near distal end; apical comb with short thick teeth anteriorly gradually becoming longer and thinner toward posterior margin. Spermatheca as shown in figure 5.

Paratypes: 2♂, 10♀ same data as holotype, 9♂, 20♀ 52 mi E San Luis, XII-27-60, 10♂, 20♀, IX-30-68, ELS. Size of paratypes: length, 5.6–8.0 mm (mean ♂ 6.45; ♀ 7.13 mm); width 2.5–3.6 mm (mean ♂ 2.84; ♀ 3.31 mm). Paratypes deposited in the following collections: CASC, CIAN, CSLB, CWOB, ELSC, FWPC, INIA, LACM, and USNM.

Other specimens examined: MEXICO. *Sonora*, 72 mi E San Luis, VIII-22-60 (T. Schowalter); 57.9 mi W Sonoyta, IV-14-62; Sa. Pinacate, 2 mi S Mexico #2, I-26-62. CALIFORNIA. Imperial Co., Imperial Dam, V-3-58. ARIZONA. *Pima Co.*, (the following locations in Organ Pipe Cactus National Monument) Alamo Wash ½ mi E Hwy. #85, II-23-62, V-26-62; Bonito Well, II-12-61; Dos Lomitas XII-29-60; 15.8 mi N Headquarters, X-29-62; Quitobaquito, XII-28-60, X-28-61, I-24-62, VIII-5-62; Ajo Mtns., X-16-35, Bryant, CASC. *Maricopa Co.*, Picacho, V-1-42 and VI-28-41, Bryant, CASC. ?UTAH. *Washington Co.*, St. George, Wickham, CASC, (probably a labeling error). A total of 432 specimens examined. Unless noted otherwise, material was collected by ELS and is in ELSC.

Remarks: This species is very similar to *E. vagans*; however, it can easily be differentiated by the length of the seta-like scales on the dorsum, morphology of the spermatheca, and the feeble indication of a median carina on the rostrum. Greater morphological continuity of specimens from different locations (Fig. 32) is seen in this species than in *vagans*. This may be due to the existence of males in all the locations recorded.

Biology: All of the material was collected from *Larrea tridentata* at night. The adults feeding on vegetation are most numerous in late December and early January. A few stragglers are present year around.

Eucyllus echinus Van Dyke

Figures 8, 9, 12, 13, 21, 23, 25

Eucyllus echinus Van Dyke 1936, 31. Type locality—"Cave Creek, Maricopa Co., Arizona." (CASC 4144 Ent.) a female. Holotype examined.

Description: Body length 4.0–5.3 mm (mean 4.9); width 1.8–2.2 mm (mean 2.1); elongate oval; vestiture brown to dirty gray; derm black, with irregular patches of brownish silver scales; seta-like scales twice as long as broad, truncate at apices or slightly rounded, appearing club-like and erect. Rostrum having a feeble indication of a median carina extending from epistoma to posterior margin of head; strongly sculp-

tured when denuded. Funiculus with first, second, and third segments nearly same length, slightly longer than scape. Head feebly sculptured with a few rather small, oval punctures, which are most evident when denuded. Prothorax with irregular dark patches; disc with large deep punctures with a mean of 24.3 per .25 mm². Elytral vestiture brownish in color with irregular dark patches. Femora uniformly brown in color without distinguishing markings or spurs; apical comb of tibia 3 with rather short thick teeth from anterior to posterior all about the same length. Acdeagus rather wide with sides almost parallel, tapering to a rather abrupt, blunt apex, not curved or twisted, however, slightly arcuate dorsoventrally (Fig. 21); spermatheca as in figures 8–9.

Distribution (Fig. 32): MEXICO. *Sonora*, 52 mi E San Luis, XII-27-60; 51 mi E San Luis, XII-30-60. ARIZONA. *Pima Co.*, (the following locations in Organ Pipe Cactus National Monument) Alamo Wash ½ mi E Hwy. #85, II-23-62; Dos Lomitas, XII-29-60; Headquarters, IX-29-61; 14 mi N Headquarters, II-24-62; 15 mi N Headquarters, X-29-61; Quitobaquito, XII-28-60, X-28-62. *Pinal Co.*, 3 mi NE Apache Junction, XII-4-62. *Maricopa Co.*, Gila Bend, Wickham coll., Picacho, V-1-42, Bryant, and the type locality. UTAH. *Washington Co.*, 15 mi SW Shivwits, VIII-13-62, Ross Hardy coll.; St. George, A. M. Woodbury. NEVADA. *Lincoln Co.*, 10 mi N US #91 on Elgin Road in the Mormon Mountains, V-18-62, Ross Hardy coll.; *Nye Co.*, 19 mi SE Lathrop Wells, III-24-70, and 2 mi SW Mercury, V-25-71. Unless otherwise noted, material was collected by ELS and is in ELSC. Material will be distributed to appropriate institutions. One hundred four specimens were examined.

Intensive collecting has not turned up specimens of *echinus* between Cave Creek, Maricopa County, Arizona and the Washington-Lincoln Counties area of Utah-Nevada, a distance of 240 airline miles.

Remarks: This species is closely related to *unicolor* but can be distinguished by its dorsal seta-like scales and a feeble median carina on the rostrum. The spermatheca is very distinct and shows only a slight variability in form throughout the specimens examined. Parthenogenicity seems to exist in the population in Nevada and Utah as no males have been taken there.

Biology: The specimens from Quitobaquito and 15 mi N Headquarters (Organ Pipe Cactus National Monument) were taken on *Franseria dumosa* and *Franseria* sp. The material from Nye County, Nevada was beaten from an undetermined species of *Franseria* and *Larrea divaricata*. All other material collected by ELS and that collected by Ross Hardy were from *Larrea tridentata*. In the Arizona-Sonoran portion of the range, the adult population is present in largest numbers on

the vegetation in December at which time the females were found to be carrying an average of four mature ova.

***Eucyllus cinereus*, new species**

Figures 10, 10a, 18, 19, 26

Holotype: Female, California, Inyo County, White Mountains, Grandview Public Camp, 8400 ft, VIII-13-64, ELS, ELSC #82. **Allotype:** same data as holotype. Length 3.8 mm, width 1.7 mm; differing in narrow form and with scattered brown scales on dorsum.

Description: Length 4.4 mm; width 2.2 mm; elongate oval; derm mahogany brown; scales and seta-like scales uniformly white giving the body a gray color, no irregular dark patches on dorsum; setae three times as long as broad, erect, truncate at apices, appearing club-like. Rostrum as long as broad, shorter than in other species; feebly sculptured; a feeble indication of a median sulcus extending posteriorly from the epistoma to the anterior margin of the head; punctures on the rostrum moderate in size, oval in shape, rather shallow compared to the other species; scrobes with dorsal and lateral margins reaching orbital of eye channel of scrobe with a feeble median carina converging with orbital of eye, this evident when denuded. Funiculus with second segment one and one-half times longer than third. Prothorax with disc feebly flattened with large deep punctures separated by their diameter and numbering 43.2 per .25 mm²; elytra uniformly gray in color; length of second abdominal sternite not quite as long as three plus four combined, and shape slightly different than occurs in other species; tibia has apical comb with anterior teeth short and thick gradually becoming longer posteriorly until posterior teeth are one-half again as long as anterior teeth while maintaining same thickness. Spermatheca as in figures 10 and 10a.

Paratypes: All 21 are from California, Inyo Co., White Mountains, 9♀ same data as holotype (4 ELSC, 2 FWPC, 1 CASC, 1 LACM, 1 CSLB). 9♀ from type locality, VIII-10-65 (4 ELSC, 1 CASC, 1 LACM, 2 USNM, 1 BYUC); 1♀ type locality, VIII-15-65, M. L. West coll.; 1♀, 7.0 mi S Schulman Grove, 9000 ft, VI-25-63, M. L. West coll.; 1♀, 3.0 mi N Westgard Pass, 7300 ft, VIII-15-64. Length 3.7–4.6 mm (mean 4.0 mm); width 1.5–1.9 mm (mean 1.62 mm). A total of 23 specimens were examined. Unless otherwise noted, the material was taken by ELS and is in ELSC. A few of the paratypes have faint indications of mottling with brown.

Distribution: The range of this species is at present limited to the White Mountains, Inyo County, California (Fig. 32). It would seem probable that it will be encountered in the drier mountain ranges to the east in Nevada, such as the Silver Peak Mountains.

Remarks: This species is generally smaller than

the other species within the genus. *Eucyllus cinereus* can be easily separated from the other species by size, coloration, shorter rostrum, seta-like scales, the spermatheca (Figs. 10, 10a), and the aedeagus. Other minor characters also aid in defining this species. These are the shape and length of the second abdominal sternite, and the length of the posterior teeth on the apical comb of the tibia 3.

Biology: The specimens from the type locality were taken on *Artemisia tridentata* and *Purshia tridentata*. The other specimens were taken during sweeping of various vegetation types. No mature ova were encountered in the material taken from the period of late June through mid August. The habitat of this weevil is the high Pinyon-Juniper region. The apparent altitudinal range of this species is from 7300–9000 ft: the highest of any in the genus.

***Eucyllus carinarostris*, new species**

Figures 6, 14, 22

Holotype: Female, California, Riverside Co., Pinto Wash Well, II-17-62, 1000 ft, ELS, in ELSC #81.

Description: Length 4.6 mm; width 2.0 mm; elongate oval; derm black, scales dirty white giving body a brownish color; seta-like scales twice as long as broad, recurved, peg-like, and brown in color. Rostrum with strong indication of a median carina extending from epistoma to anterior margin of head; this evident when denuded; a rather deep fovea on each side of the carina with large shallow punctures; rostrum rather strongly sculptured. Funiculus with second segment longer than third, but not twice the length of the third. Disc of prothorax feebly convex with round deep punctures with a mean of 29.7 per .25 mm² spaced approximately their diameter apart. Elytra with a few irregular dark patches, however, mostly uniformly straw colored. Femora with no distinctive markings; tibiae having the apical comb with anterior teeth short and thick, gradually becoming longer towards the posterior margin and closer together while maintaining same thickness. Spermatheca as in figure 6.

Paratypes: All five from California, Riverside Co., 1♀, same data as holotype; 1♀, Joshua Tree National Monument, 7 mi NW Old Dale Junction, I-28-61; 3♀, 5.4 mi NW Old Dale Junction, III-17-61. All material taken by ELS. Length 4.1–5.0 mm (mean 4.4 mm); width 2.0–2.4 mm (mean 2.14 mm). Distribution of paratypes 2 ELSC, 1 FWPC, 1 LACM, 1 USNM. Only six specimens were examined.

Distribution: Apparently limited to the Pinto Basin and the old Pinto Lake drainage system in Riverside County, California (Fig. 32).

Remarks: This species closely resembles *E. unicolor* but can be readily distinguished by the median rostral carina and the shape of the spermatheca.

Biology: All material was taken on *Larrea tridentata*. Northwest of Old Dale Junction it occurred with *E. vagans*. At Pinto Wash Well it was taken on the same plants with *E. vagans* and *Miloderes* sp.

Eucyllus unicolor Van Dyke

Figures 7, 11, 24, 27

Eucyllus unicolor Van Dyke, 1936, 32. Type locality—"Utah in 1921." (CASC 4145 Ent.). Holotype examined.

Description: Length 4.5–5.0 mm (mean 4.65 mm); width 2.0–2.4 mm (mean 2.09 mm); derm brown to black; scales white, seta-like scales dirty white, no distinct color markings on dorsum; seta-like scales generally twice as long as broad, recurved, rounded at apices. Rostrum with feeble indication of a median fova approximately midway up the rostrum from the epistoma, no indication of a median carina; feebly sculptured, this evident when denuded; punctures on rostrum larger than those on head, but not as large as those found on related species. First segment of funiculus approximately same length as second, third segment slightly shorter than preceding segments. Punctures on prothorax round and rather deep with a mean of 32.4 per .25 mm²; prothorax without distinct marking or patches; the sides not as rounded as in most species. Elytra with no distinguishing marks, uniformly straw color; femora with no distinguishing marks, tibia with apical comb of anterior teeth short, gradually becoming longer posteriorly while maintaining same thickness, posterior teeth not more than one-half again as long as anterior teeth. Spermatheca as in figure 7.

Other type material: One paratype from Westgard Pass, Inyo Co., California, not examined.

Distribution: UTAH. *Washington Co.*, St. George (and vicinity), no other data; Dixie State Park, VII-3-63. NEVADA. *Nye Co.*, 19 mi SE Lathrop Wells, III-24-70. Tanner (1959) reports this species from "St. George, Washington Co., Utah, A. M. Woodbury; Virgin River, Washington Co., Utah, C. J. Weidt, 1892; SW end Cedar Mountains, Toole Co., Utah, W. J. Thomas, VIII-25-53; Peach Springs, Ariz., Ulke, 1896; 'Ariz.'" and again Tanner (1966) from the Nevada Test Site "Area 28 (vicinity of Rock Valley) and . . . Cane Springs." Both of these locations are in Nye County. It is our opinion that this species is confined to western Utah and south central Nevada (Fig. 32). This is based on extensive collecting in southwestern United States and the absence of recently collected, correctly labeled material from other than the locations cited. Numerous snout beetle

specimens have been encountered bearing the label "Peach Springs, Ariz., Ulke" that were apparently mislabeled. Several of these species have been searched for, in vain, in the Peach Springs area. They have been encountered in southwestern Utah and southeastern Nevada. The "Ariz." labeled material gives no real information. This leaves the paratype from "Westgard Pass." This paratype has not been located but it is probably *E. ciureus* which we have previously mentioned resembles *unicolor*. Nineteen specimens were examined.

Discussion: *Eucyllus unicolor* resembles *carinarostris* and *echinus*, but can be readily separated by the length and shape of the setae and the lack of a median carina on the rostrum. The spermatheca is very different from all of the species of the genus (Fig. 7).

Biology: The material examined from St. George was captured on *Larrea tridentata*. Most of the specimens from 19 mi SE Lathrop Wells were on *Franseria* sp.

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TWO NEW SPECIES OF NORTH AMERICAN FLAT BUGS (HEMIPTERA: ARADIDAE)

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ABSTRACT: Two new species of Aradidae are described.

Among unidentified material in the entomological collections of the Natural History Museum of Los Angeles County (LACM), I discovered specimens of the following two undescribed species of Aradidae.

SUBFAMILY ARADINAE

GENUS *Aradus* FABRICIUS, 1803

Aradus nevadensis, new species

Figures 1-2

Description: Male. Elongate ovate; head, pronotum, and scutellum finely granulate. *Head* longer than its width across eyes (1.27:1); anterior process strong, with parallel sides, reaching basal $\frac{1}{3}$ of antennal segment II; antenniferous tubercles acute, diverging, reaching apical $\frac{1}{3}$ of antennal segment I; lateral tooth small, but distinct; preocular tubercles acute, postocular also acute. Eyes reniform, strongly protruding. Depressions of vertex deep, converging backward in an arc. Antennae slender, almost twice as long as width of head across eyes (1.93:1); antennal segment II narrower than fore femora, gradually dilating toward the tip; relative length of antennal segments I to IV: 1:4.28:1.86:1.14. Labium reaching mesosternum. *Pronotum* less than half as long as its maximum width across middle of lateral borders (1:2.22); the latter strongly convex, rounded; straight and converging anteriorly, and bearing a few small

teeth. Disc raised before and behind deep, transverse depression; inner carinae parallel, very slightly diverging backward. *Scutellum* triangular, longer than its basal width (1.23:1); lateral borders slightly convex at base, then straight; raised. Tip narrowly rounded. Disc raised at basal $\frac{2}{3}$, transversely rugose on apical $\frac{3}{4}$. *Hemelytra* reaching apical $\frac{1}{4}$ of genital lobes; corium expanded and rounded laterally at base, reaching $\frac{1}{2}$ of connexivum V. *Abdomen* ovate; posteroexterior angles of connexiva II to IV not protruding, V and VI slightly protruding, VII forming rounded lobes; inner border of genital lobes slightly diverging behind middle. Sternum VI longer than VII medially (1.2:1). *Color* black to piceous on head, pronotum and scutellum, with exception of latero-posterior borders of pronotum and tip of scutellum, which are white or whitish. Antennal segments I, II, and basal $\frac{2}{3}$ of III, dark brown; apical $\frac{1}{3}$ of III whitish. IV black. Corium of hemelytra ochraceous mottled with whitish, infusate on apical $\frac{2}{3}$; membrane fuscous, whitish at base. Connexivum dark brown with whitish posteroexterior angles and hind borders, the latter with a slight, reddish tinge in middle. Ventral side of body reddish brown, with whitish posteroexterior angles of connexiva. Legs dark brown; coxae and tips of tibiae, whitish. *Size*—total length 7.12

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